Supplement of

Extensive spatiotemporal analyses of surface ozone and related meteorological variables in South Korea for the period 1999–2010

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Figure S1. Power spectra of (a) log-transformed O\textsubscript{3} 8h time series ([O\textsubscript{3}]) and its baseline (KZ\textsubscript{29,3}[O\textsubscript{3}]) at the City Hall of Seoul, (b) daily average surface insolation (SI) and its baseline (KZ\textsubscript{29,3}SI), and (c) daily maximum temperature (T\textsubscript{max}) and its baseline (KZ\textsubscript{29,3}T\textsubscript{max}) observed at the weather station in Seoul for the period 1999–2000. Each power spectra of original time series and its baseline obtained by KZ\textsubscript{29,3} filter are represented as black and red lines, respectively.
Figure S2. Time series of (a) baseline of log-transformed $O_3$ $8h$ ($[O_3 \text{ BL}]$) and combined meteorological variables regressed on the baseline ($a_0 + \sum a_i \text{ MET}_{\text{BL}}(t)$), (b) $c(t)$ and long-term component ($[O_3 \text{ LT}]$), and (c) $\delta(t)$ at the City Hall of Seoul. (d) Power spectrum of $\delta(t)$. (e) Autocorrelation of $\delta(t)$ and short-term component ($[O_3 \text{ ST}]$).
Figure S3. Total anthropogenic emissions of (a) NOx and (b) VOCs in the SMA and in South Korea (KMOE, 2013). It should be noted that the rapid decrease in NOx emissions between the years 2006 and 2007 mainly results from applying different assessment method to the NOx emissions from the energy industry before and after 2007.
Figure S4. Spatial distributions of $R^2$ between baselines of O$_3$ ([$O_3$ BL]) and daily maximum temperature ($T_{\text{max BL}}$) in (a) winter, (b) spring, (c) summer, and (d) autumn, and $R^2$ between [$O_3$ BL] and daily average insolation (SI BL) during (e) winter, (f) spring, (g) summer, and (h) autumn for the period 1999–2010.
Figure S5. Spatial distributions of number of days in each wind direction (WD) during the months of frequent high O₃ events (May–October) for the period 1999-2010.
Figure S6. The first leading mode of SVD between the seasonal components of (a) daily maximum 8-h average O$_3$ ([O$_3$ SEASON]) and (b) daily average NO$_2$ ([NO$_2$ SEASON]) with (c) time series of the SVD expansion coefficient associated with [O$_3$ SEASON] mode (blue line) and [NO$_2$ SEASON] mode (red line).
Figure S7. The first leading mode of SVD between the short-term components of (a) daily maximum 8-h average O\textsubscript{3} ([O\textsubscript{3} ST]) and (b) daily average NO\textsubscript{2} ([NO\textsubscript{2} ST]) with (c) time series of the SVD expansion coefficient associated with [O\textsubscript{3} ST] mode (blue line) and [NO\textsubscript{2} ST] mode (red line).
Figure S8. The second mode of SVD between the short-term components of (a) daily maximum 8-h average O₃ ([O₃ ST]) and (b) daily average NO₂ ([NO₂ ST]) with (c) time series of the SVD expansion coefficient associated with [O₃ ST] mode (blue line) and [NO₂ ST] mode (red line).